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Zyda, Michael J.

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Michael J. Zyda

Professor

(408) 656-2305
zyda@cs.nps.navy.mil

Research Areas

Computer graphics, specifically the development of large-scale, networked 3D virtual environments and visual simulation systems.

Research Description

Professor Zyda is one of the principal investigators of the NPSNET Research Group in the Department of Computer Science. The NPSNET Research Group is a group of faculty, staff, and students that works in all areas of networked virtual environments.

The research group is currently focused on the following virtual environment (VE) research topics: the large-scale networking of virtual environments (environments greater than 1,000 players), VE network applications protocols, rapidly reconfigurable VE network protocols, Distributed Interactive Simulation (DIS) and High-Level Architecture (HLA) protocols, the real-time walkthrough of large-scale networked VEs, world modeling software for managing large scale networked VEs, the instrumentation of the human body and its representation in the networked VE, hypermedia integration (how we place video, audio, imagery and textual data in the networked VE), and geometric modeling (terrain, building and other object modeling).

The NPSNET Research Group's efforts focus on the development of the above software areas and the integration of proven components of that work into our core software system, NPSNET. NPSNET is currently capable of simulating articulated humans, and ground, air and sea-going vessels in the DIS networked virtual environment. NPSNET can support about 250-300 players using currently available networking and workstation technology. NPSNET is the first 3D virtual environment that is capable of playing across the multicast backbone (MBONE) of the Internet.

Recent Publications

Macedonia, Michael R., Zyda, Michael J., Pratt, David R., Brutzman, Donald P. and Barham, Paul T., "Exploiting Reality with Multicast Groups." *IEEE Computer Graphics & Applications* (revised from appearance in the VRAIS 1995 Proceedings), September 1995, pp.38-45.

Virtual Reality: Scientific and Technological Challenges, ed. N. Durlach and A. Mavor, Committee on Virtual Reality Research and Development, National Research Council. National Academy of Sciences Press, Washington, DC 1994. Sections written or with major contributions: Chapters - "Executive Summary", "Overview", "Computer Hardware and for the Generation of Virtual Environments", and "Networking and Communications".

Macedonia, Michael R., Zyda, Michael J., Pratt, David R., Barham, Paul T. and Zeswitz, Steven, "NPSNET: A Network Software Architecture for Large Scale Virtual Environments," *Presence*, Vol. 3, No. 4, Fall 1994, pp.265-287.

Stone, Steve, Zyda, Michael, Brutzman, Don and Falby, John S., "Mobile Agents and Smart networks for Distributed Simulations," in the Proceedings of the 14th DIS Workshop, 11 - 15 March 1996, Orlando, Florida.

Bible, Steven R., Brutzman, Don and Zyda. Michael, "Using Spread Spectrum Ranging Techniques for Position Tracking in a Virtual Environment," in the Proceedings of Network Realities '95, 26-28 October 1995, Boston, Massachusetts.

Macedonia, Michael and Zyda, Michael, "A Taxonomy for Networked Virtual Environments," in the Proceedings of Network Realities '95, 26-28 October 1995, Boston, Massachusetts.

Lentz, Fred C., Shaffer, Alan B., Pratt, David R., Falby, John S. and Zyda, Michael J., "Virtual Reality: Naval Training for the Future," accepted as a Professional Note for the *Naval Institute Proceedings*.